Justification diagrams in a DevOps context

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(MDE + RE CNRS working group
08/12/2021, Toulouse (virtually)

Facebook outage (04/09/2021)

DevOps: It takes a village

ETS Research chair
DevOps for SDN

UQÀM

TELUS

ÉTS

energr

McMaster Centre for Software Verification

SPARKS

SM@RT

McMaster University

Queen's University

DevOps w.r.t. MDE & RE?

Justifying or Explaining?

Preliminary results
DevOps w.r.t. MDE & RE

29th IEEE International Requirements Engineering Conference
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Abstract

Context: DevOps lifecycle

Have I said blatant (MDE)?

Requirements Engineering for the Ageing Population: a Teaching Perspective

Context: DevOps lifecycle

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Requirements Engineering for the Ageing Population: a Teaching Perspective

Context: DevOps lifecycle

Have I said blatant (MDE)?
**DevOps@MODELS workshop series**

- **2019**
  - 35 participants
- **2020**: Cancelled (COVID-19)
- **2021**
  - 60 participants
  - 2 industrial keynotes

**What people see when talking about DevOps**

**The Three Ways of DevOps**

- **Flow**
  - From Development to Operations
  - Identify Value Streams
  - Maximize / Speedup streams
- **Feedback**
  - Amplify feedback
  - Problems must not happen again
- **Continuous Learning**
  - Disciplined approach
  - Support risk taking / experimentation

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**Plot twist!**

*Myth: DevOps is Just "Infrastructure as Code" or Automation.* While many of the DevOps patterns shown in this book require automation, DevOps also requires cultural norms and an architecture that allows for the shared goals to be achieved throughout the IT value stream. This goes far beyond just automation.

"DevOps isn't about automation, just as astronomy isn't about telescopes."
“DevOps isn’t about automation, just as astronomy isn’t about telescopes.”
- John Willis

Justifying or Explaining?
(the RELAI project)

Example: e-Health & DevOps

Marie-Jean Meurs
Vision: Frontline service for mental health

Collect an annotated corpus of textual conversations, from patients received by the emergency units in Switzerland and Belgium.

Train a model to support the diagnostic of suicidal risk.

Challenge: Convincing Ethic committees

- Need to obtain three different ethics committees certifications
  - (Super) Long & (Super) tedious process (multi-days meeting in 🇨🇭, early 2020).
  - Looks like a classical "certification" process
  - Insights (ongoing):
    - Strengthen the DMP
    - Give confidence to defend it
    - Even if not executable!

Challenge: Automated Support for developers

Enhance tooltips and error handlers in IDEs with composable requirements that are driven by external & evolving concerns.

To “explain” or to “justify”?

**Explain** verb
- explain, explaining, explains

**Justify** verb
- justify, justifies, justifying

**Essential Meaning of explain**
1. to make (something) clear or easy to understand
   - I need a lawyer to explain this contract to me.
   - The professor explained the poem to the class.
2. to be the reason for or cause of something
   - Scientists could not explain the strange lights in the sky.

**Essential Meaning of justify**
1. to provide or be a good reason for (something); to prove or show (something) to be just, right, or reasonable
   - He tried to justify his behavior by saying that he was being pressured unfairly by his boss.
   - The fact that we are at war does not justify treating innocent people as criminals.
2. to provide a good reason for the actions of someone
   - Why should I have to justify myself? (to provide an explanation for my actions) when it was their fault?
The point is not to “explain” the release process.

It is clearly to “justify” it!

Show it is just right and reasonable.

Justification diagram language

@startuml

conclusion C = "Software is ready for launch" = "Internal"
strategy S = "Software is functionnal"
domain D = "Internal"
rationale R = "ISO 1234"
support A = "JUnit test logs"
support B = "Jenkins test logs"

S --> C
D --> S
R --> S
A --> S
B --> S

@enduml

Justification Patterns

Linked to GitHub actions pipeline to instantiate a pattern on a given project.
Wrap-up

- **DevOps is not just about automation**
  - Strong relationship with MDE & RE
  - Even if "explainability" is a research cash cow
    - we actually need to **justify**!
- **Justification Diagrams** can **model** such a process
  - **Preliminary results** applied to GitHub Actions
  - **Extracting DevOps requirements** from legacy pipelines
  - **Open-source DSL** available for Justification Diagrams
Open positions

• 8 prof positions:
  • 6 assistant/associate @McMaster (open profile)
  • 2 assistant/associate @UQAM (HCI / System)
• 5+ postdocs positions
• 6+ Ph.D. positions
• 7+ M.Sc./M.Eng. (+internships)

Open Postdoc positions

• Model-Based Development of Assured Autonomous Vehicles
• Certification and Assurance of Security and Safety Properties
• Mixed-Criticality Systems and Dynamic Risk Assessment via Machine Learning
• Optimizing Performance and Architecture of Large-Scale Cloud-Based Fare Collection Systems
• Migration from Decentralized to Centralized Automotive E/E Architectures
• Model-Driven Engineering (MDE) for Mobile Health Applications
• Usability, Accessibility and Design Languages for Wayfaring in Transport Systems

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Credits

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• Juergen Dingel (Queen’s University, Kingston, 🇨🇦)
• Corinne Pulgar (ÉTS, Montréal, 🇨🇦)
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